

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY

BIOTECHNOLOGY

B. Tech I – Year

I - Semester

THEORY						
S.No	Code	Subject	L	T	P/D	Credits
1	EG 111	English - I	2	0	0	2
2	MT 112 BT 111	Engineering Mathematics – I for BiPC stream Basics of Biology – I for MPC stream	3	1	0	3
3	PY 113	Engineering Physics	3	0	0	3
4	CY 113	General Chemistry	3	0	0	3
5	CS 111	Programming and Problem Solving	3	1	0	3
6	BT 112	Fundamentals of Biotechnology	3	1	0	3
7	EE 111	Principles of Electrical Engineering	3	1	0	3
PRACTICALS						
8	EG 112	English Language Laboratory – I	0	0	2	1
9	PY 114/ CY 116	Engineering Physics Lab – I / Chemistry Lab – I	0	0	3	2
10	CS 114	Programming Lab - I	0	0	3	2
11	ME 115	Workshop Practice	0	0	3	2
TOTAL			20	04	11	27

II – Semester

THEORY						
S.No	Code	Subject	L	T	P/D	Credits
1	EG 121	English - II	2	0	0	2
2	MT 122 BT 121	Engineering Mathematics – II for BiPC stream Basics of Biology – II for MPC stream	3	1	0	3
3	PY 124	Biophysics	3	0	0	3
4	BT 122	Bio-organic Chemistry	3	0	0	3
5	CS 121	Object Oriented Programming through C++	3	1	0	3
6	CE 112	Environmental Studies	3	1	0	3
7	BT 123	Introduction to Anatomy and Physiology of Humans	3	1	0	3
PRACTICALS						
8	EG 122	English Language Laboratory – II	0	0	2	1
9	PY 126 BT 124	Biophysics Lab / Chemistry Lab – II	0	0	3	2
10	CS 122	Programming Lab - II	0	0	3	2
11	ME 122N	Engineering Drawing	0	0	3	2
TOTAL			20	04	11	27

ENGLISH – II
(common to all branches)

Instruction	2L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	2

Course Objectives:

- To understand the difference between oral and written communication, interpersonal and intrapersonal communication
- To acquaint the students with the process of technical writing through different types of reports and information transfer.
- To enhance the different sub- skills of reading through skimming and scanning.
- To enhance imaginative, creative and critical thinking through literary texts.
- To help students develop their Presentation skills through AV aids and different aspects of body language.

UNIT- I

Effective communication: Intrapersonal communication, Interpersonal communication, Dyadic Communication, One way versus two way communication and Johari Window.

UNIT- II

Grammar Practice: Common errors in English ad, Punctuation.

Vocabulary Enhancement:

Indian and American usage, Words often misspelt, Prefixes & Suffixes, technical vocabulary

Prose: Muthyala Raju Revu: An Engineer Turned IAS Officer.

UNIT- III

Writing Skills: Reports, Technical Report Writing, Information transfer: Flow charts, piecharts, graphs and scientific papers

UNIT- IV

Reading comprehension – Unknown passages, Skimming and Scanning, intensive reading and critical analysis.

Prose: R. Madhavan : Engineering to Farming

UNIT- V

Soft Skills: Presentation skills – Rubrics, use of AV aids and making of a Power Point Presentation, Body Language. Leadership skills and Team Building.

Text Books:

1. “Essential English”- E Suresh Kumar et al.(Orient Black Swan PVT Ltd.)
2. “Communication Skills and Soft Skills: An Integrated Approach”- E Suresh Kumar et al. (Pearson Publications)

Suggested Reading:

1. ” High School English Grammar & Composition” – Wren and Martin (S.Chand)
2. “ABC of Common Grammatical Errors” – Nigel D Turton (Macmillan)
3. “Communication Skills & Soft Skills” – An Integrated approach – E Suresh Kumar (Pearson)
4. “Examine your English” – Margaret M Maison (Orient Longman)
5. “Professional Presentation” – Malcolm Goodale (Cambridge University Press)
6. “English Grammar at a glance” – M. Gnanamurali (S. Chand)
7. “Business Communication & Soft skills” (Lab Manual) – D. Sudha Rani (Pearson)
8. “A Course Book in English” – K.R. Lakshminarayan (SciTech Publication)
9. “Effective Technical Communication” – M. Ashraf Rizvi (Tata- McGraw Hill)

ENGINEERING MATHEMATICS – II
(Bio-Tech)
(for BiPC stream)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	2

UNIT- I

Partial Fractions: Resolving $f(x)/g(x)$ into partial fractions, $g(x)$ contains non repeated linear factors, $g(x)$ contains repeated and non repeated linear factors, $g(x)$ contains non repeated irreducible factors, $g(x)$ contains repeated and not repeated irreducible factors.

UNIT - II

Integration: Integration considered as converse of differentiation, simple integrations of algebraic, trigonometric and exponential etc. Methods of integration, integration by parts, integration of rational, irrational and Trigonometric functions, definite integrals

UNIT- III

Differential Equations: Differential equations of First order and first degree, Variable separable, Homogeneous, linear, Bernoulli's and Exact differential equations.

UNIT- IV

Differential Equations of Higher Order: Differential equations of higher order with constant coefficients, Complimentary functions and particular Integrals, Particular Integrals of e^{ax} , $\sin ax$, $\cos ax$, x^m , $e^{ax} \sin bx$, $e^{ax} \cos bx$, Differential equations of higher order with variable coefficients, Cauchy's and Legendary form of linear equations.

UNIT- V

Linear Algebra: Solution of system of Linear equations by Inverse, Gauss Jordan and Cramer's Rule. Cayley Hamilton Theorem (without proof)

Text Books:

1. Text book Mathematics by N. Krishnamurthy, Chand series Volume-I & II
2. Differential equations by S. Chand series
3. Higher Engineering Mathematics -by B.S. Grewal

Suggested Reading:

1. Matrices by A.R. Vasistha

BASICS OF BIOLOGY–II
(Bio-Tech)
(for MPC stream)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

UNIT- I**ANIMAL KINGDOM CLASSIFICATION**

Classification of animal kingdom. Phylogeny of invertebrate and vertebrate phyla. Salient features of non chordates up to phyla, and chordates up to class level. Binomial and trinomial nomenclature. Concept of species and genus.

UNIT- II**CELL AND TISSUES: STRUCTURE AND FUNCTIONS**

Structure of animal cell and its organelles. Differences between plant and animal cell. Level of organization, multicellularity : diploblastic and triploblastic conditions. Asymmetry, symmetry: radial symmetry and bilateral symmetry. Acoelomates, pseudocoelomates and eucoelomates in brief. Animal tissues structure and functions. Different types of animal tissues and their functions. Epithelial, Connective, Muscular and Nervous tissues.

UNIT- III**PARASITOLOGY: PARASITISM AND PARASITIC ADAPTATION**

Health and disease: introduction, life cycle, pathogenicity, treatment and prevention; *Entamoeba histolytica*, *Plasmodium vivax*, *Ascaris lumbricoides* and *Wuchereria bancrofti*. Life history of house fly and mosquito in spreading disease, brief account of pathogenicity, treatment and prevention of typhoid, pneumonia, common cold and ring worm.

UNIT - IV: ECOLOGY AND ENVIRONMENT

Organism and environment, habitat and niche. Population and ecological adaptations, population interactions. Abiotic environmental factors – light, temperature, water and radiation. Biotic environmental factors –neutralism, competition, mutualism, commensalism, parasitism, predation. Attributes, growth, birth rate and death rate, age distributions.

UNIT - V: GENETICS

Structure and Functions of chromosome. Concept of gene and alleles, multiple alleles, ABO blood groups – Sex determination, sex chromosomes, sex linked inheritance, gene expression and regulation in prokaryotes and eukaryotes, one gene - one polypeptide hypothesis.

Text Books:

1. Text book of Botany, I and II year, Vignam publisher, Guntur
2. Text book of Zoology, I and II year, Vignam publisher, Guntur.
3. Biology. Raven, Johnson, Losos, Mason, Singer. Tata Mc Graw Hill Publishing Co. Pvt. Ltd 9th edition, 2010.

Suggested Reading:

1. Beginning Science: Biology. B.S. Beckett. Oxford University Press. 1st edition, 1983.
2. University Botany I: (Algae, Fungi, Bryophyta And Pteridophyta). S.M. Reddy. New age International (P) Ltd. Publishers, New Delhi. 1st edition, 1996
3. Botany for Degree students. A.C. Dutta, Oxford University Press. 6th Edition, 1998
4. Introduction to Applied biology and Biotechnology. K Vaidhyanath, K Pratap Reddy and K Sathya Prasad. BS Publications. India. 2004

BIOPHYSICS
(Bio-Tech)

Instruction	3L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

UNIT – I

Introduction: Definition of Biophysics – Cell theory and Atomic theory – Electrical properties of cell and tissues–Electrical oscillatory phenomenon associated with cell division (Cellular spin resonance).

Microscopes: Structure, construction and functions of a compound microscope – Types and functions of different Microscopes: Phase Contrast Microscope, Interference Microscope, Polarizing Microscope and Electron Microscope – High Resolution Optical Imaging.

UNIT – II

Human Eye: Structure of retina and its biometrics – Optics of the Eye – Camera principle & its application to the Eye – Mechanism of accommodation–Visual acuity – Colors and its recognition.

Human Ear: Structure and mechanics of hearing –Auditory receptors and Genesis of different potential charges in the Ear – Determination pitch, Loudness and quality of sound.

UNIT – III

Radiation and Light Action: Nature of Ionizing Radiation – Target theory – Inactivation of proteins and nucleic acids through radiation effects – Radiation Effects on cells and tissues – Action of ionizing radiation on Chromosomes – GM counter and dosimetry of radiation.

Principles and Biological Applications: X –ray diffraction analysis: Bragg’s law for atomic Structure determination.

UNIT – IV

Biomedical Instrumentation: Principle, working and biological applications of ultrasonic imaging –Endoscopy – Computational Tomography (CT) – Nuclear Magnetic Resonance (NMR) – Magnetic Resonance Imaging (MRI) – Positron Emission Tomography (PET) – Electrocardiograph (ECG) Electroencephalograph (EEG).

UNIT – V

Osmosis Phenomenon: Osmosis – Osmotic fragility of red blood cells – Transport through membrane – Solute Transport: Artificial kidney.

Methods of Determination of Viscosity and Surface Tension of Bioliquids: Viscosity Specific and intrinsic viscosities and their determination by Ostwald’s method – Experimental determination of viscosity and surface tension of bioliquids by capillary flow method.

Text Books & Suggested Reading:

1. Molecular Biophysics by RB Setlow and EC Pollard,Addition Weley, Publishing Company, Inc.,1964.
2. Bio Physical Chemistry by A.G.Marshall, Wiley & Sons , New York.
3. Intermediate Physics for Medicine and Biology by Russel K. Hebby.
4. Introduction to Biophysics, Tyszynski J.A, Kurzynki.M, First Edition, (2003), CRC Press, Florida.
5. Physical Biology of the Cell, by Phillips, Rob/Kondney, Jane, ISBN-10: 0815341636 Publisher Routledge.
6. Essentials of Biophysics, 1 st Edition, Narayanan. K , (2005), New age publishers, New Delhi.
7. Biomedical Electronics and instrumentation by Onkar N. Pandey & Rakesh Kumar. S.K.Kataria & Sons, 2nd ed
8. Medical Physics by John R. Cameron and James G. Skofronick, Wiley publishers
9. Modern Physics by D Holiday, R Resnik & KS Krane Fifth edition, John Wiley & Sons Inc. (2002).
10. Modern Physics by Concepts of Modern Physics by A. Beiser, Sixth edition. Tata Mc Graw Hill .
11. Structure and Biophysics - New Technologies for Current Challenges in Biology and Beyond Puglisi, Joseph D. (EDT)
12. Applied Biophysics - Tom A. Waigh. Ohn Wiley , Sons Inc.,(2007), ISBN: 047001718X.
13. Physical Biology of the Cell by Rob Phillips, Jané Kondev , Julie Theriot Garland Science; 1 edition (2008).
14. Molecular and Cellular Biophysics by Jackson, Meyer B. ISBN-10: 0521624703 Publisher Cambridge Univ Press.
15. Chemical Biophysics: Quantitative Analysis of Cellular Systems, by Beard, Daniel A./ Qian, Hong, Cambridge Univ. Press.
16. Biophysics, 4 th Edition, Glaser .R, (2001), Springer, New York..
17. Jackson. M.B , Molecular & Cellular Biophysics, First edition, (2006) , Cambridge University Press.
18. Understanding of Enzymes, Fourth edition, Trevor Palmer, (2003), Cambridge University Press, New York.
19. Creighton,T.E., Proteins Structure and molecular properties, 2 nd edition, 1993, W H freeman publishers
20. Physics for Diagnostic Radiology by PP Dendy and B Heaton, 3rd ed, CRC press

BIO-ORGANIC CHEMISTRY
(Bio-Tech)

Instruction	3L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

UNIT-I**ISOMERISM AND STEREOCHEMISTRY OF ORGANIC COMPOUNDS**

Isomerism-Types of isomerism- structural (keto-enol-tautomerism) and Stereoisomerism-Optical, geometrical and conformational isomerisms-enantiomers, diastereomers, meso compounds, Racemic mixture. Sequence rules for R, S-configuration and Fisher projections of Lactic acid and Tartaric acid. E & Z- configuration.

UNIT-II**BIOMOLECULES - CARBOHYDRATES**

Nomenclature, Classification and Structure of Carbohydrates- glucose, fructose, maltose, glycogen, dextrin, cellulose and starch; Open chain and Haworth (cyclic) structure of glucose and fructose, General reactions of glucose and fructose, and their inter conversions-mutarotation. Role of Carbohydrates as a source of Energy and Health.

UNIT-III**BIOMOLECULES - LIPIDS AND AMINO ACIDS**

Chemistry of Lipids –Structure and classification of Fatty Acids-saturated and unsaturated fatty acids, Oils; Properties of oils, Tests to check purity of oils and fats - acid value, saponification value, Iodine Value, Reichert-Meisel value.

Chemistry of Amino acids-Classification, structure and reactivity. Synthesis of amino acids- amination of α -halogen acids, Gabriel phthalimide synthesis, strecker synthesis.

UNIT – IV**CHEMISTRY OF HETEROCYCLIC COMPOUNDS**

Classification of Heterocyclic compounds, Structures of 5 -membered heterocyclic compounds- Furan, Thiophene, Pyrrole, and 6-membered heterocyclic compounds Pyridine and their important derivatives- Quinoline, isoquinoline. Aromaticity and resonance structure of heterocyclic compounds.

UNIT – V**CHEMISTRY OF BIO PRODUCTS**

Alkaloids–Introduction, Occurrence, Functions of Alkaloids, Classification, Isolation; Chemistry of Ephedrine and Papaverine; Chemistry of Alkaloids Derivatives - Purine and Xanthine Bases- Caffeine and Uric Acid; Chemistry of Terpenoids-Isolation, Classification, General characteristics.

Text Books:

1. Organic chemistry. Robert. T. Morrison and Robert N. Boyd, Prentice Hall India, Delhi. 6th edition, 2002.
2. Fundamentals of Biochemistry-JL Jain.
3. Text Book of Organic Chemistry-Vol-I, L FINAR, Longman Group.
4. Text Book of Organic Chemistry. B.S.Bahl and Arun Bahl. S Chand and Co. Delhi. 19th edition, 2005.

Suggested Reading:

1. Principles of Organic Chemistry. M. K. Jain. S.Nagh & Co. 9th edition
2. Organic Chemistry. Solomon
3. Natural Products by O.P. Agarwal-Vol-I & II

OBJECT ORIENTED PROGRAMMING THROUGH C++
(common to all branches)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

UNIT- I

Principles of Object Oriented Programming: Procedure Vs Object Oriented, Paradigm, Basic concepts, benefits, Applications and Object Oriented Languages.

Introduction: Program structure, Creating, Compiling and Linking of C++ program.

Token, Expression and Control Structures: Tokens, Keywords, Identifiers and Constants, Data Types, Operators, Precedence, Type Compatibility, Control Structures, New Features of C++.

Functions: Function Prototype and Parameter Passing, Inline Functions, Default, Constant Arguments, Recursion, Function Overloading, Function Template.

UNIT - II

Classes and Objects: Defining classes and Member functions, Arrays, Static Members, Friend Functions.

Constructors and Destructors: Type of Constructors, Dynamic Initialization of Objects, Destructors.

UNIT - III

C++ operator overloading: Fundamentals, restrictions, overloading unary / binary operators, overloading ++ and --, Manipulation of Strings.

C++ Inheritance: Defining derived classes, Types of Inheritance, Virtual Base class Abstract Class, Nesting of classes.

UNIT- IV

Pointers and Polymorphism: Pointers and Generic pointer, Pointer to Objects and Derived Classes, this pointer, Virtual Functions, Virtual Destructors.

C++ Stream Input/Output: Streams, Stream classes, Formatted and Unformatted operations, Manipulators.

Files: Classes for file Stream operations, Sequential and Random access operations, Command line Arguments

UNIT-V

C++ Templates: Introduction, class templates, member function template, overloading template functions.

C++ Exception Handling: Try, throw, catch

Suggested Reading:

1. E. Balagurusamy "Object Oriented Programming with C++", McGraw-Hill Education (India), 6th Edition 2013
2. Bjarne Stroustrup "The C++ Programming Language", Pearson Education, 5th Edition (2013)
3. Robert Lafore "Object-Oriented Programming in C++" 4th Edition Sams Publishing, 2002

ENVIRONMENTAL STUDIES
(common to all branches)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

Course Objectives:

1. To equip the students with inputs on the environment, natural resources, ecosystems and Bio-diversity.
2. To enable the students become aware of environmental pollutions, causes, effects and control measures.
3. To make the students contribute for capacity building of nation for arresting and/or managing environmental disasters.

UNIT – I

Environmental Studies Definition, Scope and importance, need for public awareness. Natural resources: Water resources, use and over utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Effects of modern agriculture, fertilizer pesticide problems, water logging salinity. Energy resources: growing energy needs, renewable and non-renewable energy sources. Land resources; land as a resource, land degradation, soil erosion and desertification.

UNIT – II

Ecosystems: Concept of an ecosystem, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT – III

Biodiversity: Genetic species and ecosystem diversity, bio-geographical classification of India. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity

UNIT – IV

Environmental Pollution: Cause, effects and control measures of air pollution, water pollution, soil pollutions, noise pollution, thermal pollution and solid waste management. Environment protection act: Air, water, forest & wild life acts, issues involved in enforcement of environmental legislation.

UNIT – V

Social issues and the environment: Water conservation, watershed management, and environmental ethics. Climate change- global warming, acid rain, ozone layer depletion, Environmental protection act, population explosion
Disaster Management: Types of disasters, impact of disasters on environment, infrastructure and development, Basic principles of disaster mitigation, disaster management, and methodology disaster management cycle and disaster management in India

Text Books:

1. Y. Anjaneyulu, Introduction to Environmental Science, B.S. Publications, 2004
2. S.S.Dara, A Text book of Environmental Chemistry & Pollution Control, S.Chand&Comp. Ltd, 2000.

Suggested Reading:

1. De A.K. *Environmental Chemistry*, Wiley Eastern Ltd., 1989.
2. Odum E.P. *Fundamentals of Ecology*, W.B. Saunders Co., USA, 1975.
3. Rao M.N. and Datta A.K., *Wastewater treatment*, Oxford & IBH publishing Co., 1987.
4. Miller T.G. Jr. *Environmental Science*, Wordsworth Publishing Co., 1984.
5. Benny Joseph, *Environmental Studies*, Tata Mc. Graw Hill education Pvt. Ltd., 2000
6. Raman Siva Kumar, *Introduction to environmental Science and Engineering*, Tata Mc. Graw Hill education Pvt. Ltd., 2010.

**INTRODUCTION TO ANATOMY AND PHYSIOLOGY OF HUMANS
(Bio-Tech)**

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

UNIT – I

INTRODUCTION TO ANATOMICAL TERMS AND ENDOCRINE GLANDS

Different types of animal cells and tissues.

Various organs of human body and their general roles

Types of endocrine glands- anatomy and physiological of pituitary, thyroid, pancreas and gonads

Classification of hormones and mode of action

UNIT- II

ANATOMY OF SKELETAL, DIGESTIVE AND EXCRETORY SYSTEMS

Structure and function of bones and muscles

Digestive system- organs and functions; role of liver and pancreas

Excretory system- kidney and urinary bladder; physiology of excretory system- urine formation

UNIT- III

ANATOMY OF CIRCULATORY AND RESPIRATORY SYSTEMS

Circulatory system- anatomy of heart, heart beat, blood circulation

Anatomy of blood vessels- arteries and veins

Respiratory system- anatomy of lungs and mechanism of respiration

UNIT- IV

ANATOMY OF NERVOUS SYSTEM AND OTHER SENSORY SYSTEMS

Nervous system- peripheral and autonomous nervous system;

Spinal cord; nerve impulse and reflex arc

Special senses- eye, ear, tongue and nose

UNIT- V

REPRODUCTIVE SYSTEM AND BLOOD PHYSIOLOGY

Mechanism of blood oxygenation

Blood pressure recording and regulating techniques

Reproductive system- male and female reproductive organs and physiology

Menstrual cycle and development of embryo

Text Books:

1. Charles E. Tobin, Basic Human Anatomy, McGraw Hill, 1980
2. An Introduction to Human Physiology. Third Edition. By J. H. Green. Oxford University Press, New York, (1972)
3. Human Physiology- the Mechanism of body functions, McGraw-Hill Science/Engineering/Math; 11th edition (2007)
4. 'Essentials of Human Anatomy and Physiology' by .Elaine.N. Marieb, 8th Ed, Pearson Education, New Delhi, (2007)

ENGLISH LANGUAGE LABORATORY – II
(common to all branches)

Instruction	2 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	1

COMPUTER ASSISTED LANGUAGE LEARNING LAB (CALL)

Introduction:

The language lab focuses on the practice of connected speech and word stress. They are also introduced to the process of Listening.

The following are the **objectives** of the course:

1. To recognize and be familiar with word stress and identify stress patterns.
2. To develop awareness of rhythm and notion of stress time.
3. Listen effectively in a variety of situations for a variety of purposes, practice the behavior of effective , active listeners.
4. Assess strengths in listening and set goals for the future .

SYLLABUS:

1. Word stress: Primary stress, secondary stress, functional stress, rules of word stress.
2. Rhythm & Intonation: Introduction to Rhythm and Intonation. Major patterns, intonation of English with the semantic implications.
3. Aspects of connected speech: Strong forms, weak forms, contracted forms, elision.
4. Listening skills.

INTERACTIVE COMMUNICATION SKILLS LAB (ICS LAB)

Introduction:

The objective of the course is to introduce them to the art of making effective presentations. They also learn do debate, the interview process and interview skills.

The following are the **objectives** of the course:

1. To enable students to express themselves fluently and appropriately in social and professional contexts.
2. To provide techniques for preparing and delivering a presentation.
3. Practicing interview skills via an interpersonal encounter similar to real life situation.
4. To understand and communicate various forms of argument effectively, to develop the ability to analyze, evaluate, construct and refute arguments.

SYLLABUS:

1. Debate: Differences between a debate and a group discussion. Essentials of a debate, conducting a debate.
2. Presentation Skills: Making effective presentations, expressions which can be used in presentation, use of non-verbal communication, coping with stage fright , handling question and answer session; use of audio- visual aids , Power point presentations.
3. Interview skills: Planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interview.

Suggested Reading:

1. E.Suresh kumar et al, . **English for Success** (with CD), Cambridge University Press India Pvt Ltd. 2010.
2. T Balasubramanian. **A Textbook of English Phonetics for Indian Students**, Macmillan, 2008.
3. J Sethi et al. **A Practical Course in English Pronunciation** (with CD), Prentice Hall India, 2005.
4. Edgar Thorpe. **Winning at Interviews**, Pearson Education, 2006
5. Priyadarshi Patnaik. **Group Discussions and Interviews**, Cambridge University Press Pvt Ltd 2011

BIOPHYSICS LAB
(Bio-Tech)

Instruction	3 Periods per alternate week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

1. Determination of Blood Pressure at different postures using sphygmomanometer
2. Estimation of chlorophyll in the given leaves
3. Hall Effect (Determination of Hall coefficient)
4. Determination of ultrasonic velocity in the given bio-liquid using ultrasonic interferometer
5. Determination of mass absorption coefficient of the given biomaterial using GM counter
6. Determination of dielectric constant of the given biomaterial
7. Determination of molecular weight of given polymer using Ostwald Viscometer
8. Determination of Planck's constant
9. Study of osmotic fragility of blood
10. Determination of specific gravity of blood

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CHEMISTRY LAB - II
(Bio-Tech)

Instruction	3 Periods per alternate week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

I. IDENTIFICATION OF ORGANIC COMPOUND WITH SINGLE FUNCTIONAL GROUPS

1. Identification of Aldehyde functional groups
2. Identification of Ketone functional group
3. Identification of Amine functional group
4. Identification of Monosaccharides

II. PREPARATION OF ORGANIC COMPOUNDS

1. Preparation of m-dinitro Benzene
2. Preparation of Aspirin

Suggested Reading:

1. Vogel's text book of quantitative chemical analysis by J.Mendham and Thomas, Person education.Pvt.Ltd.New Delhi, 6th.ed.2002.
2. Senior practical physical chemistry by B.D.Khosla, A.Ghulati, V.C.Garg;R.Chand and CD New Delhi.

PROGRAMMING LAB - II
(common to all branches)

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

1. Program to implement function overloading
2. Program to implement function template
3. Program to implement types of constructors and destructor
4. Program to implement new and delete operators (Dynamic memory allocation).
5. Program to implement unary and binary operator overloading
6. Creation of inheritance hierarchy for graphic shapes.
7. Implementation of runtime polymorphism
8. Classes for Bank Account, Student information, Library catalog
9. Implementation of Streams.
10. Implementation of Template Classes.

ENGINEERING DRAWING
(common to Chemical & Bio-Tech)

Instruction	3D Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Credits	2

Course Objectives:

1. To provide an exposure in understanding the drawings during a multidisciplinary approach towards a problem
2. To train up in perception and imagination of a three dimensional scenario.

Course Outcomes:

1. To understand theory of projections
2. Ability to improve visualization skills
3. Ability to sketch Engineering Objects

UNIT- I

Introduction: Instruments and their uses, Lettering and dimensioning.

Engineering curves - ellipse, parabola, hyperbola, cycloid, epicycloids and hypocycloid

UNIT- II

Projection of points and straight lines: projection of points placed in different quadrants. Projection of straight lines inclined to one of the reference planes.

UNIT- III

Projection of planes: projection of perpendicular planes inclined to one reference plane.

UNIT- IV

Projection of planes: projection of planes inclined to both the reference planes. Traces of planes.

UNIT- V

Projection of solids: polyhedral, solids of revolution, projection of solids with axis inclined to one plane and parallel to another reference plane.

Text Books:

1. N.D.Bhatt, "Elementary Engineering Drawing", Charotar Publishers, 2012.
2. Basanth Agrawal and C M Agrawal "Engineering Drawing 2e", McGraw-Hill Education(India) Pvt. Ltd.

Suggested Reading:

1. K.L.Narayana and P.K.Kannaiah, "Text Book of Engineering Drawing", Scitech Publications, 2011.
2. P.S.Gill "Engineering Graphics", Kataria Publications, 2011.
3. K.Veenugopal, "Engineering Drawing and Graphics + Autocad", New Age International Pvt.Ltd, 2011.
4. Shaw M.B and Rana B.C., "Engineering drawing", Pearson, 2nd edition, 2009
5. P I Varghees, "Engineering Graphics", Tata McGraw-Hill publications, 2013
6. Bhattacharya. B, "Engineering Graphics", I. K. International Pvt.Ltd, 2009
7. Dhawan R.K., "Principles of Engineering Graphics and Drawing", S. Chand 2011